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TRANSMITTAL OF APPEAL BRIEF (Large Entity)

Docket No.  
LWEP:119US

Re Application Of: Ralf Krueger

Application No.	Filing Date	Examiner	Customer No.	Group Art Unit	Confirmation No.
10/605,492	10/02/2003	Michael N. Opsasnick	24041	2626	2491

Invention: **PHASE SHIFT METHOD AND APPARATUS FOR IMPLEMENTING PHASE-CONTRAST OR MODULATION-CONTRAST OBSERVATION ON MICROSCOPES**

COMMISSIONER FOR PATENTS:

Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed on:  
**February 6, 2007 and Reply to Non-Compliant Notice Dated June 7, 2007 - Fee Previously Paid**

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/C. Paul Maliszewski/

*Signature*

Dated: **June 20, 2007**

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U.S. Patent Application 10/605,492  
Attorney Docket No.: LWEP:119US

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

U.S. Patent Application No.: 10/605,492

Confirmation No.: 2491

Appellant: Ralf KRUEGER

For: PHASE SHIFT METHOD AND APPARATUS FOR IMPLEMENTING PHASE-  
CONTRAST OR MODULATION-CONTRAST OBSERVATION ON MICROSCOPES

Filed: October 2, 2003

TC/Art Unit: 2626

Examiner: Michael N. Opsasnick

Docket No.: LWEP:119US

Customer No.: 24041

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I certify that this Brief on Appeal is being deposited on June 20, 2007 with the U.S. Postal Service as first class mail under 37 C.F.R. §1.8 and is addressed to Mail Stop Appeal Brief- Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

/C. Paul Maliszewski/

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**AMENDED APPEAL BRIEF UNDER 37 C.F.R. § 41.37**

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Honorable Sir:

Appellant respectfully appeals the decision of the Examiner to finally reject Claims 1-3 and 8-13, as set forth in the final Office Action of September 22, 2006. A Notice of Appeal was timely filed by the Appellant on December 22, 2006. The required Appeal Brief fee in the amount of \$500.00 was included with the Appeal Brief filed February 6, 2007. This Amended Appeal Brief is in response to a Notice of Non-Compliant Appeal Brief dated June 7, 2007.

A **Claims Appendix** follows page 22 of this paper.

An **Evidence Appendix** follows page 24 of this paper.

A **Related Proceedings Appendix** follows page 25 of this paper.

### **REAL PARTY IN INTEREST**

The Real Party in Interest in this matter is Leica Microsystems CMS GmbH, assignee.

### **RELATED APPEALS AND INTERFERENCES**

There are no related appeals or interferences.

### **STATUS OF CLAIMS**

The application originally contained 7 claims. Claims 8-13 were added in a Preliminary Amendment dated February 26, 2004. Claims 4-7 were cancelled in the February 26, 2004 Preliminary Amendment.

Claims 1-3 and 8-13 stand as finally rejected.

Claims 1-3 and 8-13 are the subject of this Appeal.

### **STATUS OF AMENDMENTS**

There are no amendments filed subsequent to final rejection.

### **SUMMARY OF THE CLAIMED SUBJECT MATTER**

The present invention relates to an apparatus for implementing phase-contrast or modulation-contrast observation on microscopes with the aid of a modulator (7) arranged in each pupil plane in the observation beam path. The apparatus contains at least one layer modifying the phase or amplitude of a stop (3) arranged in the illumination beam path. For stepless adaptation of the phase shift, the modulator (7) is mounted tiltably. The invention further concerns a method for implementing a defined phase shift.

#### **1. Claim 1**

Claim 1 recites an apparatus (shown in Figure 1 and described on page 3, first paragraph of Summary) for implementing phase-contrast or modulation-contrast observation (described on page 3, first full paragraph and throughout the specification) on microscopes with the aid of a modulator

(7) (shown in Figures 1-3 and described on page 3, third full paragraph and last paragraph; page 4, third paragraph; page 5; and page 6 (parts list)). The modulator is arranged in each pupil plane (see page 3, third full paragraph) in the observation beam path (see Figure 1 and page 5, first paragraph) and contains at least one layer (see Figures 2 and 3; page 3, fourth and fifth full paragraphs; page 4, first paragraph; and page 5, first through third paragraphs) modifying the phase or amplitude (see page 3, end of third full paragraph and fourth full paragraph; and page 4, second and fourth paragraphs), and of stop (3) (see Figure 1; page 5, beginning first paragraph; and page 6, parts list), arranged in the illumination beam path (see Figure 1; page four, fourth paragraph; and page 5, first paragraph). The modulator is mounted dynamically tiltable (see (7) and (14) in Figure 3; page 3, third and fifth full paragraphs; page 4 respective ends of first, third, and fourth paragraphs; page 5, middle of first paragraph and third paragraph; and page 6, part (14)). Further, at least a portion of the at least one layer modifying the phase or amplitude is transmissive (see Figures 1-3; page 5, end of second paragraph; and page 6, items 10-12).

## 2. Claim 11

Claim 11 recites an apparatus (shown in Figure 1 and described on page 3, first paragraph of Summary) for implementing phase-contrast or modulation-contrast observation (described on page 3, first full paragraph and throughout the specification) on microscopes with the aid of a modulator (7) (shown in Figures 1-3 and described on page 3, third full paragraph and last paragraph; page 4, third paragraph; page 5; and page 6 (parts list)) arranged in each pupil plane (see page 3, third full paragraph) in the observation beam path (see Figure 1 and page 5, first paragraph) and containing at least one layer (see Figures 2 and 3; page 3, fourth and fifth full paragraphs; page 4, first paragraph; and page 5, first through third paragraphs) modifying the phase or amplitude (see page 3, end of third full paragraph and fourth full paragraph; and page 4, second and fourth paragraphs). The apparatus also includes a stop (3) (see Figure 1; page 5, beginning first paragraph; and page 6, parts list) arranged in the illumination beam path (see Figure 1; page four, fourth paragraph; and page 5, first paragraph). Optical polarization means in combination with retardation plates are included for phase shifting (see page four second paragraph), the modulator is mounted dynamically tiltable (see (7) and (14) in Figure 3; page 3, third and fifth full paragraphs; page 4 respective ends of first, third,

and fourth paragraphs; page 5, middle of first paragraph and third paragraph; and page 6, part (14)), and at least a portion of the at least one layer modifying the phase or amplitude is transmissive (see Figures 1-3; page 5, end of second paragraph; and page 6, items 10-12).

### 3. Claim 12

Claim 12 recites an apparatus (shown in Figure 1 and described on page 3, first paragraph of Summary) for implementing phase-contrast or modulation-contrast observation (described on page 3, first full paragraph and throughout the specification) on microscopes with the aid of a modulator (7) (shown in Figures 1-3 and described on page 3, third full paragraph and last paragraph; page 4, third paragraph; page 5; and page 6 (parts list)) arranged in each pupil plane (see page 3, third full paragraph) in the observation beam path (see Figure 1 and page 5, first paragraph) in the observation beam path (see Figure 1 and page 5, first paragraph) and containing at least one layer (see Figures 2 and 3; page 3, fourth and fifth full paragraphs; page 4, first paragraph; and page 5, first through third paragraphs) modifying the phase or amplitude (see page 3, end of third full paragraph and fourth full paragraph; and page 4, second and fourth paragraphs), and of a stop (3) (see Figure 1; page 5, beginning first paragraph; and page 6, parts list) arranged in the illumination beam path (see Figure 1; page four, fourth paragraph; and page 5, first paragraph). The various modulators are arranged on a carrier in a manner introducible into the beam path of the microscope and are selectably mounted (see Figure 3 and page 4, third paragraph), dynamically tiltable individually or dynamically tiltable together with the carrier on that carrier (see (7) and (14) in Figure 3; page 3, third and fifth full paragraphs; page 4 respective ends of first, third, and fourth paragraphs; page 5, middle of first paragraph and third paragraph; and page 6, part (14)), and at least a portion of the at least one layer modifying the phase or amplitude is non-reflective (see transmissivity - Figures 1-3; page 5, end of second paragraph; and page 6, items 10-12)).

### 3. Claim 13

Claim 13 recites a method for implementing a defined phase shift in the implementation of phase-contrast or modulation-contrast observation (described on page 3, first full paragraph and throughout the specification) on microscopes with the aid of a modulator (7) (shown in Figures 1-3 and described on page 3, third full paragraph and last paragraph; page 4, third paragraph; page 5;

and page 6 (parts list)) arranged in each pupil plane (see page 3, third full paragraph) in the observation beam path (see Figure 1 and page 5, first paragraph) and containing at least one layer (see Figures 2 and 3; page 3, fourth and fifth full paragraphs; page 4, first paragraph; and page 5, first through third paragraphs) modifying the phase or amplitude (see page 3, end of third full paragraph and fourth full paragraph; and page 4, second and fourth paragraphs), and of a stop (3) (see Figure 1; page 5, beginning first paragraph; and page 6, parts list) arranged in the illumination beam path of the microscope (see Figure 1; page four, fourth paragraph; and page 5, first paragraph), wherein the modulator is dynamically tilted (see (7) and (14) in Figure 3; page 3, third and fifth full paragraphs; page 4 respective ends of first, third, and fourth paragraphs; page 5, middle of first paragraph and third paragraph; and page 6, part (14)) and wherein the at least one layer modifying the phase or amplitude is transmissive (see Figures 1-3; page 5, end of second paragraph; and page 6, items 10-12).

#### **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

1. Whether Claims 1, 12, and 13 are unpatentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,777,783 (Endou)?
2. Whether Claims 2, 8, 9, and 11 are unpatentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,777,783 (Endou) in view of U.S. Patent No. 6,687,052 (Wilson)?
3. Whether Claim 3 is unpatentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,777,783 (Endou) in view of U.S. Patent No. 6,057,894 (Kobayashi)?
4. Whether Claim 10 is unpatentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,777,783 (Endou) in view of U.S. Patent No. 6,057,894 (Kobayashi) as applied to Claim 3 above, and further in view of U.S. Patent No. 6,687,052 (Wilson)?

#### **ARGUMENT**

1. Whether Claims 1, 12, and 13 are unpatentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,777,783 (Endou)?

A.) Summary of the Rejection: The Examiner stated: “Endou teaches an apparatus for implementing phase-contrast or modulation contrast observation on microscopes with the aid of a modulator (26b) arranged in each pupil plane (col.10 lines 30-31) in the observation beam path and containing at least one layer modifying the phase or amplitude (col. 10 lines 28-30) and a stop (6) arranged in the illumination beam path (Fig. 1) and a portion of at least one layer modifying the phase or amplitude is transmissive (Fig. 1). Endou further teaches the modulator are arranged on a carrier in a manner introducible into the beam path of the microscope (col. 13 lines 5-10). Endou lacks specific reference to dynamically tilting the modulator. Endou does suggest that rotation of the modulator can be required in a modulation contrast image (col. 13 lines 6-8). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the modulator of Endou dynamically tiltable as suggested by Endou for the purpose of allowing for modulation contrast without having to remove the modulator and replace it with another modulator.”

B.) The References cited by The Examiner: For purposes of providing background, Appellant briefly discusses the references cited by the Examiner.

1.) U.S. Patent No. 5,777,783 (Endou)

Endou teaches a microscope has an optical system in which the number of photographing optical paths can be increased. The optical system includes a light source, an illuminating optical system for radiating the illuminating light to a sample, an objective lens which is opposed to the sample, an imaging lens, which is arranged in an optical path of light passed through the objective lens, a first beam splitting block, arranged in an optical path between the objective lens and the primary image, for splitting the light passed through the imaging lens into at least three different directions, a second beam splitting block for splitting one of the light split by the first beam splitting block into a plurality of directions, an observation optical path which receives the light split by the second beam splitting block, and a plurality of photographing optical paths provided for the split light, wherein images of the same magnification are formed.

C.) Arguments

“To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in knowledge generally available to one having ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or the references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure.” MPEP § 2142 (citing *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991))

1.) Claim 1

a.) Endou does not teach, suggest or motivate a dynamically tiltable modulator

Claim 1 recites: “wherein the modulator is mounted dynamically tiltable.” The Examiner admits that Endou does not teach a dynamically tiltable modulator: “Endou lacks specific reference to dynamically tilting the modulator.” (bottom page 2, top page 3 of the Final Office Action dated September 22, 2006, hereinafter referred to as the Office Action).

The Examiner goes on to state: “Endou does suggest that rotation of the modulator can be required in a modulation contrast image (col. 13 lines 6-8).” This is irrelevant. Claim 1 recites tilting, not rotation. As further discussed below, rotation and tilting are completely different actions.

The Examiner then concludes: “It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the modulator of Endou *dynamically tiltable as suggested by Endou*.” (emphasis added). **Endou does not suggest tilting**. Col. 13, lines 5-8 of Endou state: “In observing a modulation contrast image, *unlike in observing a phase contrast image*, it is necessary to **rotate** a pupil modulator to adjust the polarity of the contrast of the image.” (emphasis added). The Examiner has made an unsubstantiated and unsupported leap by saying that Endou’s reference to rotation is somehow a suggestion to perform the completely different operation of tilting.

The Examiner then states: “It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the modulator of Endou dynamically *tiltable as suggested by Endou*” (emphasis added). **Endou made no such suggestion**. Instead, Endou only addresses rotation and makes no suggestion regarding tilting, a totally different operation.



b.) There is no motivation to modify Endou to form the claimed invention

"Virtually all inventions are combinations of old elements. Therefore, an Examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue." *In re Rouffet*, 47 U.S.P.Q.2d 1453 (Fed. Cir. 1998).

When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references and the teachings of the references can be combined only if there is some suggestion or incentive to do so. *In Re Lee*, 61 U.S.P.Q.2d 1430 (Fed. Cir. 2002), citing *In re Fine*. Hence, elements of separate patents cannot be combined when there is no suggestion of such combination in those patents. *Panduit Corp. v. Dennison Manufacturing Co.*, 1 U.S.P.Q.2d 1593 (Fed. Cir. 1987). Additionally, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills* 16 U.S.P.Q.2d 1430. Thus, the question of motivation to combine references is material to patentability and cannot be resolved on subjective belief and unknown authority. *In Re Lee, supra*.

The recognized law for combining references to support the conclusion that the claimed combination of structural features is directed to obvious subject matter requires that either the references expressly or impliedly teach or suggest the claimed combination, or the Examiner must present a convincing line of reasoning as to why an artisan would have found the claimed invention to have been obvious in light of the teachings of the references. *See e.g., Ex parte Clapp*, 227 USPQ 972 (973) (PTO Br Pat. App. & Int. 1985); *In re Geiger*, 2 USPQ2d 1276 (CA, Fed. Cir. 1987)."

As a motivation to perform a dramatic modification of Endou to create the claimed invention, the Examiner stated: "It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the modulator of Endou dynamically tiltable as suggested by Endou for the purpose of allowing for modulation contrast *without having to remove the modulator and replace it with another modulator*." (emphasis added).

Despite the Examiner's assertion, Endou clearly teaches away from not having to remove a modulator: "Since the pupil modulator 26b is *detachably provided* in the main microscope housing

1, the size of the pupil modulating section is reduced and the *operability is improved*.” (col. 13, lines 9-11) (emphasis added). Endou praises the removability of his modulator and actually espouses the use of a removable modulator. That is, Endou explicitly teaches that detachability is desirable, if not necessary, which is the exact opposite of the suggestion assigned by the Examiner to Endou. The Examiner has failed to show any motivation or suggestion in Endou to modify Endou.

c.) The Examiner has failed to provide a convincing argument

The recognized law for combining references to support the conclusion that the claimed combination of structural features is directed to obvious subject matter requires that either the references expressly or impliedly teach or suggest the claimed combination, *or the Examiner must present a convincing line of reasoning as to why an artisan would have found the claimed invention to have been obvious in light of the teachings of the references. See e.g., Ex parte Clapp*, 227 USPQ 972 (973) (PTO Br Pat. App. & Int. 1985); *In re Geiger*, 2 USPQ2d 1276 (CA, Fed. Cir. 1987).” (emphasis added).

As shown *supra*, Endou does not teach, suggest, or motivate the modification of Endou to create the invention recited in Claim 1. Further, the Examiner has failed to provide a convincing line of reasoning as to why the claimed invention would be obvious in light of the teachings of Endou. In fact, Appellant has shown that Endou teaches the opposite of the suggestion attributed by the Examiner to Endou.

d.) The Examiner has applied impermissible hindsight

“When applying 35 U.S.C. 103, the following tenets of patent law must be adhered to:

(A) The claimed invention must be considered as a whole; (B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; (C) **The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention**; and (D) Reasonable expectation of success is the standard with which obviousness is determined. *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).” (MPEP 2141(II)) (emphasis added).

“Moreover, deficiencies of the cited references cannot be remedied by general conclusions about what is “basic knowledge,” or “common sense.” *Id.* Indeed, “to imbue one of ordinary skill in the art with knowledge of the invention ... when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher.” *Id.*; *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 220 U.S.P.Q. 303 (Fed. Cir. 1983).”

As noted *supra*, there is no teaching, suggestion, or motivation in Endou to modify Endou to form the claimed invention, nor is there any convincing reason as to why an artisan would be motivated to combine the references. The Examiner states that it would be obvious to make Endou’s modulator dynamically tiltable “as suggested by Endou.” As shown above, Endou does not teach, suggest, or motivate any type of tilting and even the rotation taught by Endou is not dynamic. Further, Endou does not teach that a detachable modulator is a problem to be solved.

Therefore, any suggestion or motivation to tilt a modulator in Endou is derived from Appellant’s disclosure. The Examiner must be pushed to a conclusion as to the patentability of Claim 1 by the teachings of the references themselves, or what is known in the art just before the invention was made. The Examiner cannot be drawn to a modification due to careful study of Appellant’s disclosure.

e.) Examiner’s Response to Arguments

“This means that the words of the claim must be given their plain meaning unless \*\*>the plain meaning is inconsistent with< the specification. *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) (discussed below); *Chef America, Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1372, 69 USPQ2d 1857 (Fed. Cir. 2004)” MPEP 2111.01(I).

“This means that the words of the claim must be given their plain meaning unless applicant has provided a clear definition in the specification. *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) (discussed below); *Chef America, Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1372, 69 USPQ2d 1857 (Fed. Cir. 2004) (Ordinary, simple English words whose meaning is clear and unquestionable, absent any indication that their use in a particular context changes their

meaning, are construed to mean exactly what they say. See, e.g., *Liebel-Flarsheim Co. v. Medrad Inc.*, 358 F.3d 898, 906, 69 USPQ2d 1801, 1807 (Fed. Cir. 2004)”

In the Office Action, the Examiner stated: “The Examiner interprets tilting and rotation to be the same within the broadest reasonable interpretation of both terms.” Appellant respectfully submits that there is no basis for this statement. The Merriam-Webster Dictionary defines ‘rotate’ as: “To turn about an axis or center.” The same dictionary defines ‘tilt’ as: “To move or shift as to incline.” These are completely different motions and Applicant submits that there is no reasonable interpretation that would encompass both terms. For example, the framework ‘movement’ might encompass both terms, but this framework is so broad as to be meaningless, and Claim 1 does not recite this broad framework.

Further, Applicant has not defined “tilt” to be different than the plain meaning of the term, nor has Applicant defined “tilting” to be in any way synonymous with “rotation.” That is, the teachings in the specification regarding tilting are clearly consistent with the above definition of tilting and any attempt to assign a meaning to tilting contrary to the above definition for tilting (for example, to equate tilting with rotating) would be inconsistent with the specification. For example, Figure 3 of the instant application clearly shows modulator (7) moving or shifting as to incline. Further a rotation of modulator (7) is not possible with the elements shown in the present invention and would be utterly at odds with the function taught for the tilting of the modulator in the present application. That is, rotating the modulator would not accomplish the function taught for the tilting of the modulator. For example, as taught on page 3, third full paragraph.

“The broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach. *In re Cortright*, 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999).” “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, *i.e.*, as of the effective filing date of the patent application.” *Phillips v. AWH Corp.*, \_\_\_ F.3d \_\_\_, 75 USPQ2d 1321 (Fed. Cir. 2005) (*en banc*).< *Sunrace Roots Enter. Co. v. SRAM Corp.*, 336 F.3d 1298, 1302, 67 USPQ2d 1438, 1441 (Fed. Cir. 2003); *Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1298 67 USPQ2d 1132, 1136 (Fed. Cir. 2003)(“In the absence of an

express intent to impart a novel meaning to the claim terms, the words are presumed to take on the ordinary and customary meanings attributed to them by those of ordinary skill in the art."). It is the use of the words in the context of the written description and customarily by those skilled in the relevant art that accurately reflects both the "ordinary" and the "customary" meaning of the terms in the claims. *Ferguson Beauregard/Logic Controls v. Mega Systems*, 350 F.3d 1327, 1338, 69 USPQ2d 1001, 1009 (Fed. Cir. 2003) (Dictionary definitions were used to determine the ordinary and customary meaning of the words "normal" and "predetermine" to those skilled in the art. In construing claim terms, the general meanings gleaned from reference sources, such as dictionaries, must always be compared against the use of the terms in context, and the intrinsic record must always be consulted to identify which of the different possible dictionary meanings is most consistent with the use of the words by the inventor.); *ACTV, Inc. v. The Walt Disney Company*, 346 F.3d 1082, 1092, 68 USPQ2d 1516, 1524 (Fed. Cir. 2003)."

It is quite clear that 'tilting' and 'rotation' have completely different meanings in the field of microscopes. For example, tilting and rotation of parts, such as a scanning mirror, in a microscope have radically different purposes and effects. Further it is clear that one skilled in the art would see completely different purposes and effects for tilting and rotation within the present application. Applicant's use of the term "tiltable" is wholly within the bounds of what is defined by reference sources and what is understood by those skilled in the art. In no way do these references or those skilled in the art equate the terms "rotational" and "tilting" in any context that is meaningful or relevant to the instant application or microscopes in general.

The Examiner also stated: "Applicant appears to draw a distinction between tilting and rotation based upon the axes about which the modulator moves. The claim language does not include any limitations regarding the axes about which the modulator is tilted therefore this argument is not persuasive." The distinction between tilting and rotation is in no way dependent upon the illustrative example provided by Appellant. This distinction is clearly apparent and inherent from the definitions shown *supra* and by the clear understanding of the terms in the art. Appellant is not arguing any limitation specifically reciting an axis. Appellant merely referred to the respective axes to illustrate the difference between tilting and rotation – it is not necessary to explicitly refer to axes

when illustrating the difference between tilting and rotation, it is merely a convenient way to show the difference. Nor is it necessary for every illustration used in an argument to be recited in the claims.

For all the reasons noted above, Endou does not teach, suggest, or motivate all the limitations of Claim 1. Therefore, Claim 1 is patentable over Endou.

2.) Claims 12 and 13

Claims 12 and 13 recite a dynamically tiltable modulator and the Examiner has applied the arguments for Claim 1 to Claims 12 and 13. Appellant has shown that Claim 1 is patentable over Endou, therefore, Claims 12 and 13 also are patentable over Endou.

2. Whether Claims 2, 8, 9, and 11 are unpatentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,777,783 (Endou) in view of U.S. Patent No. 6,687,052 (Wilson)?

A.) Summary of the Rejection: The Examiner stated: "Regarding claim 2, Endou teaches the invention as claimed but lacks reference to the greatest possible phase shift achieved by a slight tilt. Wilson teaches the modulator configured so that the greatest possible phase shift is achieved by a slight tilt (col. 3 lines 56-58). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Endou reference have the modulator configured in the manner taught by Wilson for the purpose of minimizing the amount of rotation required by the modulator to achieve the greatest phase shift so that the modulator would not require a space large enough to rotate 180-degrees and thus reduce the size of the microscope apparatus as a whole. Regarding claims 8 and 9, Endou teaches the invention as claimed but lacks reference to the use of a defined variable layer configuration. Wilson teaches a variable layer configuration (col. 3 lines 25-55). The pattern of modulators on the modulating element (6) is a variable layer configuration because the modulation of the incident light varies at different locations on the element. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Endou invention include the variable layer configuration of Wilson for the purpose of allowing the use of a single modulator to perform different modulations depending on the area of the element light contacts. Regarding claim 11, Endou teaches the invention as claimed but lacks reference to the

use of retardation plates. Wilson teaches the use of retardation plates for use with polarization modulation (col. 3 lines 18-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Endou invention include the retardation plates of Wilson for the purpose of rotating the polarization to allow for as much light intensity to pass through as possible, thus providing a better image to the observer.”

B.) The References cited by The Examiner: For purposes of providing background, Appellant briefly discusses the references cited by the Examiner.

1.) U.S. Patent No. 5,777,783 (Endou)

Endou teaches a microscope has an optical system in which the number of photographing optical paths can be increased. The optical system includes a light source, an illuminating optical system for radiating the illuminating light to a sample, an objective lens which is opposed to the sample, an imaging lens, which is arranged in an optical path of light passed through the objective lens, a first beam splitting block, arranged in an optical path between the objective lens and the primary image, for splitting the light passed through the imaging lens into at least three different directions, a second beam splitting block for splitting one of the light split by the first beam splitting block into a plurality of directions, an observation optical path which receives the light split by the second beam splitting block, and a plurality of photographing optical paths provided for the split light, wherein images of the same magnification are formed.

2.) U.S. Patent No. 6,687,052 (Wilson)

Wilson teaches a confocal microscope with two matched light sources: a first light source (1) and a second light source (8). The light sources (1,8) are arranged to illuminate opposite sides of a modulating mask (6). The light either reflecting from or passing through the modulating mask (6) is then used to illuminate an object O supported on a mount (5). The microscope is arranged so that the object O is mounted on the opposite side of the mask (6) to a camera (7) such that light reflected from the object O passes through the modulating mask (6) before being captured by the camera (7). Subtraction of the image produced using the second light source (8) from the image produced using the first light source (1) generates a confocal image that contains substantially less noise than is possible with available confocal microscopy apparatus.

C.) Arguments

“To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in knowledge generally available to one having ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or the references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure.” MPEP § 2142 (citing *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991))

1.) Claims 2, 8, and 9

a.) Claim 1 is patentable over Endou

Appellant has shown *supra* that Claim 1 is patentable over Endou, at least because Endou does not teach, suggest, or motivate a dynamically tiltable modulator.

b.) Wilson does not cure the defects of Endou

Wilson does not teach, suggest, or motivate a tiltable modulator. Therefore, Wilson does not cure the defects of Endou with respect to Claim 1 and Claim 1 is patentable over Endou and Wilson.

“If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious.” *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

Claims 2, 8, and 9, dependent from Claim 1, also are patentable over Endou and Wilson.

2.) Claim 11

a.) Endou does not teach, suggest, or motivate a tiltable modulator

Claim 11 recites: “wherein the modulator is mounted dynamically tiltable...” Appellant has shown in the arguments for Claims 1, 12, and 13 *supra* that Endou does not teach suggest or motivate a tiltable modulator. Therefore, Endou does not teach, suggest, or motivate all the elements of Claim 11 and Claim 11 is patentable over Endou.

b.) Wilson does not cure the defects of Endou

Wilson has been cited regarding a retardation plate and does not cure the defects of Endou regarding a tiltable modulator.



For all the reasons noted above, Endou and Wilson fail to teach, suggest, or motivate all the elements of Claim 11. Therefore, Claim 11 is patentable over Endou and Wilson.

3. Whether Claim 3 is unpatentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,777,783 (Endou) in view of U.S. Patent No. 6,057,894 (Kobayashi)?

A.) Summary of the Rejection: The Examiner stated: “Endou teaches the invention as claimed but lacks reference to one layer comprising glass plates of various glasses. Kobayashi teaches the use of a glass layer coupled to a modulator (col. 6 lines 4-25) for the purpose of supporting the modulating layer in a high heat environment. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Endou modulator include the glass layer of Kobayashi for the purpose of supporting the modulating layer in a heated environment, where the heat originates from the light energy of the Endou invention.”

B.) The References cited by The Examiner: For purposes of providing background, Appellants briefly discusses the references cited by the Examiner.

1.) U.S. Patent No. 5,777,783 (Endou)

Endou teaches a microscope has an optical system in which the number of photographing optical paths can be increased. The optical system includes a light source, an illuminating optical system for radiating the illuminating light to a sample, an objective lens which is opposed to the sample, an imaging lens, which is arranged in an optical path of light passed through the objective lens, a first beam splitting block, arranged in an optical path between the objective lens and the primary image, for splitting the light passed through the imaging lens into at least three different directions, a second beam splitting block for splitting one of the light split by the first beam splitting block into a plurality of directions, an observation optical path which receives the light split by the second beam splitting block, and a plurality of photographing optical paths provided for the split light, wherein images of the same magnification are formed.

2.) U.S. Patent No. 6,057,894 (Kobayashi)

Kobayashi teaches a projection type liquid crystal display comprises a dichroic prism for separating or synchronizing a light to provide fundamental colors for color display, and a unit for

enlarging and projecting a transmitted light from the liquid panel. The liquid panel has one surface fixedly attached to a transparent member and the other surface integral with the dichroic prism directly or through at least one optical component. In the projection type liquid crystal display, the light which provides fundamental colors for color display and is separated or synchronized at the dichroic prism is incident on the light incidence surface of the liquid panel through the transparent member or the dichroic prism without contacting with the air in the space. The light incident on the liquid crystal panel is irradiated from the light outgoing surface of the liquid crystal panel through the transparent member or the dichroic prism without contacting with the air in the space and thereafter enlarged and projected. With this arrangement, it is possible to simplify the structure of the peripheral optical systems of the liquid crystal panel and to improve image quality.

### C.) Arguments

“To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in knowledge generally available to one having ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or the references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure.” MPEP § 2142 (citing *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991))

#### 1.) Claim 1 is patentable over Endou

Appellant has shown *supra* that Claim 1 is patentable over Endou, at least because Endou does not teach, suggest, or motivate a dynamically tiltable modulator.

#### 2.) Kobayashi does not cure the defects of Endou

Kobayashi does not teach, suggest, or motivate a tiltable modulator. Therefore, Kobayashi does not cure the defects of Endou with respect to Claim 1 and Claim 1 is patentable over Endou and Kobayashi.

“If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious.” *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

Claim 3, dependent from Claim 1, also is patentable over Endou and Kobayashi.

4. Whether Claim 10 is unpatentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,777,783 (Endou) in view of U.S. Patent No. 6,057,894 (Kobayashi) as applied to Claim 3 above, and further in view of U.S. Patent No. 6,687,052 (Wilson)?

A.) Summary of the Rejection: The Examiner stated: “Endou in combination with Kobayashi teaches the invention as claimed but lacks reference to the use of a defined variable layer configuration. Wilson teaches a variable layer configuration (col. 3 lines 25-55). The pattern of modulators on the modulating element (6) is a variable layer configuration because the modulation of the incident light varies at different locations on the element. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the Endou in combination with Kobayashi invention include the variable layer configuration of Wilson for the purpose of allowing the use of a single modulator to perform different modulations depending on the area of the element light contacts.”

B.) The References cited by The Examiner: For purposes of providing background, Appellant briefly discusses the references cited by the Examiner.

1.) U.S. Patent No. 5,777,783 (Endou)

Endou teaches a microscope has an optical system in which the number of photographing optical paths can be increased. The optical system includes a light source, an illuminating optical system for radiating the illuminating light to a sample, an objective lens which is opposed to the sample, an imaging lens, which is arranged in an optical path of light passed through the objective lens, a first beam splitting block, arranged in an optical path between the objective lens and the primary image, for splitting the light passed through the imaging lens into at least three different directions, a second beam splitting block for splitting one of the light split by the first beam splitting block into a plurality of directions, an observation optical path which receives the light split by the

second beam splitting block, and a plurality of photographing optical paths provided for the split light, wherein images of the same magnification are formed.

2.) U.S. Patent No. 6,057,894 (Kobayashi)

Kobayashi teaches a projection type liquid crystal display comprises a dichroic prism for separating or synchronizing a light to provide fundamental colors for color display, and a unit for enlarging and projecting a transmitted light from the liquid panel. The liquid panel has one surface fixedly attached to a transparent member and the other surface integral with the dichroic prism directly or through at least one optical component. In the projection type liquid crystal display, the light which provides fundamental colors for color display and is separated or synchronized at the dichroic prism is incident on the light incidence surface of the liquid panel through the transparent member or the dichroic prism without contacting with the air in the space. The light incident on the liquid crystal panel is irradiated from the light outgoing surface of the liquid crystal panel through the transparent member or the dichroic prism without contacting with the air in the space and thereafter enlarged and projected. With this arrangement, it is possible to simplify the structure of the peripheral optical systems of the liquid crystal panel and to improve image quality.

3.) U.S. Patent No. 6,687,052 (Wilson et al.)

Wilson teaches a confocal microscope with two matched light sources: a first light source (1) and a second light source (8). The light sources (1,8) are arranged to illuminate opposite sides of a modulating mask (6). The light either reflecting from or passing through the modulating mask (6) is then used to illuminate an object O supported on a mount (5). The microscope is arranged so that the object O is mounted on the opposite side of the mask (6) to a camera (7) such that light reflected from the object O passes through the modulating mask (6) before being captured by the camera (7). Subtraction of the image produced using the second light source (8) from the image produced using the first light source (1) generates a confocal image that contains substantially less noise than is possible with available confocal microscopy apparatus.

C.) Arguments

“To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in

knowledge generally available to one having ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or the references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." MPEP § 2142 (citing *In re Vaeck*, 20 USPQ2d 1438 (Fed. Cir. 1991))

1.) Claim 1 is patentable over Endou

Appellant has shown *supra* that Claim 1 is patentable over Endou, at least because Endou does not teach, suggest, or motivate a dynamically tiltable modulator.

2.) Kobayashi and Wilson do not cure the defects of Endou

Neither Kobayashi or Wilson nor Kobayashi and Wilson teach, suggest, or motivate a tiltable modulator. Therefore, Kobayashi and/or Wilson do not cure the defects of Endou with respect to Claim 1 and Claim 1 is patentable over Endou, Kobayashi, and Wilson.

"If an independent claim is nonobvious under 35 U.S.C. § 103, then any claim depending therefrom is nonobvious." *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

Claim 10, dependent from Claim 1, also is patentable over Endou, Kobayashi, and Wilson.

**Conclusion**

For the reasons set forth above, Appellant respectfully submits that Claims 1, 12, and 13 are patentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,777,783 (Endou).

For the reasons set forth above, Appellant respectfully submits that Claims 2, 8, 9, and 11 are patentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,777,783 (Endou) in view of U.S. Patent No. 6,687,052 (Wilson).

For the reasons set forth above, Appellant respectfully submits that Claim 3 is patentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,777,783 (Endou) in view of U.S. Patent No. 6,057,894 (Kobayashi).

For the reasons set forth above, Appellant respectfully submits that Claim 10 is patentable under 35 U.S.C. 103(a) over U.S. Patent No. 5,777,783 (Endou) in view of U.S. Patent No. 6,057,894 (Kobayashi) as applied to Claim 3 above, and further in view of U.S. Patent No. 6,687,052 (Wilson).

Accordingly, Appellant prays that this Honorable Board will reverse the Examiner's rejection of Claims 1-3 and 8-13.

Respectfully submitted,

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Dated: June 20, 2007  
CPM/  
Attachment

## **CLAIMS APPENDIX**

Reprinted herebelow are the claims involved in this appeal:

Claim 1. An apparatus for implementing phase-contrast or modulation-contrast observation on microscopes with the aid of a modulator arranged in each pupil plane in the observation beam path and containing at least one layer modifying the phase or amplitude, and of a stop arranged in the illumination beam path, wherein the modulator is mounted dynamically tiltable and wherein at least a portion of the at least one layer modifying the phase or amplitude is transmissive.

Claim 2. The apparatus as defined in Claim 1, wherein the at least one layer of the modulator is configured in such a way that the greatest possible phase shift is already achieved by a slight tilt.

Claim 3. The apparatus as defined in Claim 1, wherein the at least one layer comprises glass plates of various glasses.

Claim 8. The apparatus as defined in Claim 1, wherein the modulator possesses a defined variable layer configuration.

Claim 9. The apparatus as defined in Claim 2, wherein the modulator possesses a defined variable layer configuration.

Claim 10. The apparatus as defined in Claim 3, wherein the modulator possesses a defined variable layer configuration.

Claim 11. An apparatus for implementing phase-contrast or modulation-contrast observation on microscopes with the aid of a modulator arranged in each pupil plane in the observation beam path and containing at least one layer modifying the phase or amplitude, and of a stop arranged in the illumination beam path, wherein for phase shifting, optical polarization means in combination with retardation plates are present and wherein the modulator is mounted dynamically tiltable and at least a portion of the at least one layer modifying the phase or amplitude is transmissive.

Claim 12. An apparatus for implementing phase-contrast or modulation-contrast observation on microscopes with the aid of a modulator arranged in each pupil plane in the observation beam path

and containing at least one layer modifying the phase or amplitude, and of a stop arranged in the illumination beam path, wherein various modulators are arranged on a carrier in a manner introducible into the beam path of the microscope and are selectably mounted, dynamically tiltable individually or dynamically tiltable together with the carrier, on that carrier and wherein at least a portion of the at least one layer modifying the phase or amplitude is non-reflective.

Claim 13. A method for implementing a defined phase shift in the implementation of phase-contrast or modulation-contrast observation on microscopes with the aid of a modulator arranged in each pupil plane in the observation beam path and containing at least one layer modifying the phase or amplitude, and of a stop arranged in the illumination beam path of the microscope, wherein the modulator is dynamically tilted and wherein the at least one layer modifying the phase or amplitude is transmissive.



Serial No. 10/605,492

Attorney Docket No. LWEP:119US

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**EVIDENCE APPENDIX**

No additional evidence is being submitted with this appeal.

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Attorney Docket No. LWEP:119US  
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**RELATED PROCEEDINGS APPENDIX**

Upon information and belief, no appeals or interferences are known to Appellant, which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.